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The Mineral Industry of Greece

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This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Greece

By Walter Steblez[1]

Greece remained a significant European producer of bauxite and magnesite, and an important producer of a variety of other nonmetallic and metallic minerals and mineral commodities. In 1984, the country's economy continued to stagnate; national income and industrial production each remained at about the same level as in 1983. Inflation abated somewhat from the high 22% to 24% levels of the 1982 and 1983 periods, but was still rated at about 19% by yearend. Yearend statistical reports showed a decline in the production of petroleum and coal products and an increase in nonmetallic mineral production.

The agreement with the U.S.S.R. for the construction of a 600,000-ton-per-year alumina plant at Itea remained the major mineral project. In mid-1984, both sides approved startup of this project. Other developments included the nationalization of the Esso Pappas Petroleum Group (Exxon), and continued Government feasibility studies for the construction of a 100,000-ton-per-year stainless steel plant that would use domestically produced ferronickel and ferrochromium. Reportedly, exploration and survey work for new chromite deposits was successful, assuring a sufficient reserve base for planned increases of ferrochromium production.

Government Policies and Programs.—The Government, controlled by the Pan-Hellenic Socialist Movement, maintained the policy of nationalization and/or socialization of the Greek mineral industry by all statutory and administrative means available. As in previous years, a sector of the mineral industry was targeted for takeover, and actions were taken that made normal operations problematic. In mid-1984, two large steel producers, Halyvourgiki Inc. and the Hellenic Steel Co., were reportedly charged with foreign currency transfer violations. Similar criticism was also directed against Aluminium de Grèce S.A. (AG), a subsidiary of the French aluminum company Pechiney. Although state actions against these companies remained in abeyance pending governmental decision and court resolution, in the case of Halyvourgiki, a fine of about five times the company's capital assets was levied, a sum the company would have been unable to pay. Changes in the mining code also placed deposits of minerals, such as mixed sulfides and chromite, under tight state regulations. These actions, and similar ones in the past, have reportedly caused concern in the Greek business community that the Government's nationalization program was aimed at confiscating a company's assets without compensation.

Late in the year, a conflict reportedly arose between Greece and the European Economic Community (EEC) over allegedly discriminatory provisions in the Greek mining code. According to EEC regulations in article 52 of the Treaty of Rome, discrimination against foreigners on the basis of nationality or domicile was forbidden; mining activity conducted by EEC member states' citizens in other member states was to be guaranteed by the same laws that regulated domestic mining and quarrying operations in those countries. It appeared that provisions in article 8 of the Greek Mining Law constrained the free transfer of mining rights to EEC foreign nationals by requiring prior permission by the Greek Cabinet. The EEC Commission brought charges against the Greek Government to the Euro-tribunal to force Greece's compliance with the EEC's mining regulations and practices. A deci-

sion by the Euro-tribunal against Greece would most likely force the Greek Government to comply with the EEC's mining regulations because the EEC had been funding extensive mineral exploration programs in Greece as well as the development of chromite mining and processing and electric power industries since Greece's entry into the EEC in 1981.

These policies served to further dampen an already uncertain investment climate in the country's economy and mineral industry, and conflicted with the Government's often stated aim to encourage private and foreign sources of investment in the economy, including the mineral sector.

Government plans in the field of geological and mineral research included the completion of a geological map of Greece at a 1:50,000 scale and the compilation of a geochemical map of the country. Studies would also be conducted for more accurate measurement of the country's large-scale deposits such as bauxite, nickeliferous iron ore, magnesite, and marble. Reserves would be classified by grade and economic potential. Feasibility studies would be made for possible production increases in minerals that have a more limited reserve base such as chromite, kaolin, copper, mixed sulfide ores, and other minerals. Research in the field of metallurgy and ore beneficiation would be accelerated by providing greater scope to laboratories and facilities at the National Technical University, the Institute of Geological and Mining Research (IGME), and the Project Studies and Mining Development Corp. (GEMEE). Other governmental plans included the creation of a national statistical data bank for mineral resources, reserves, and production. This agency would correlate domestic mineral data with international data. Plans were studied also to establish vocational programs in mining and metallurgy in cities near major mining and processing operations, as well as to expand and renovate existing mining facilities.

PRODUCTION

According to official statistics, the Greek mineral industry registered an overall production increase of about 20% by yearend compared with the roughly 8% decline in 1983. The production increase was largely due to increases in nickeliferous iron, magnesite, and chromium and manganese ores. On the other hand, the production of bauxite during January to November 1984 declined by over 5.5% compared with that of the same period in 1983. The production of electricity and gas rose 3.8% during this period.

The Greek mineral industry continued to come increasingly under state ownership and/or supervision. The Ministry of Energy and Natural Resources was the chief Government agency for mining and metallurgy, and energy. The subordinate National Committee of Geological, Metallurgical and Mining Policy directed lower Government bodies dealing with exploration, research, finances, and operation. IGME was mandated to do work in geological mapping, geophysical research, mineral exploration, and research on the ore beneficiation. Dealing more in the area of applied science, GEMEE conducted work in the areas of mineral exploration and exploitation, and ore beneficiation. The Hellenic Industrial Development Bank (ETVA) financed industrial infrastructure, private ventures, and carried out or commissioned feasibility studies. ETVA also formed and operated subsidiary companies such as Asbestos Mines of Northern Greece Mining S.A. (91% ownership), the Aegean Metallurgical Industries S.A. (lead-zinc and refractories), and the Hellenic Industrial & Mining Co. of Laurium (lead). The Hellenic Industrial Mining & Investment Co. (HIMIC) was largely involved in commissioning and conducting feasibility studies as well as setting up subsidiary companies. HIMIC-owned companies included the Hellenic Ferroalloys S.A. (ferrochromium). The Public Power Corp. (PPC) had the sole responsibility of conducting exploration and exploitation of energy resources, primarily lignite, used in electric power generation. Petroleum and natural gas exploration and production were conducted by the Public Petroleum Corp.

The major privately owned companies included the Bodossakis Group (mixed sulfides and lead and zinc concentrates), the Eliopoulos Kyriacopoulos Group (bauxite, perlite, barite, and bentonite), AG (bauxite, alumina, and aluminum), the Magnomin General Mining Co. S.A. (magnesite and dead-burned magnesite) and the Titan Cement Co. S.A., Halkis Cement Co., and Halyps Cement S.A.

Table 1.—Greece: Production of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity[2]	1980	1981	1982	1983[e]	1984[e]
METALS					
Aluminum:					
Bauxite, gross weight thousand tons	3,286	3,216	2,853	2,455	2,400
Alumina, gross weight do.	494	490	420	410	410
Metal:					
Primary	146,500	[e]147,000	135,000	136,181	[3]136,244
Secondary	7,116	[e]7,000	[e]7,000	1,029	2,000
Chromium: Chromite:					
Run-of-mine ore	77,611	[e]80,000	[e]80,000	83,202	230,000
Marketable products:					
Direct-shipping ore[e]	8,000	8,000	8,000	7,000	15,000
Concentrate	33,614	20,856	23,238	20,517	60,000
Copper, mine output, metal content	[e]100	100	--	--	--
Iron and steel:					
Iron ore and concentrate, nickeliferous:[4]					
Gross weight thousand tons	1,451	1,272	516	1,331	1,400
Iron content do.	624	547	221	572	600
Metal:					
Pig iron do.	303	350	[e]300	300	300
Ferrochromium	--	--	--	18,000	40,000
Ferronickel[e]	[3]51,407	51,000	51,000	50,000	55,000
Steel, crude thousand tons	935	909	910	920	920
Lead:					
Mine output, metal content[e]	[3]20,504	21,000	[r]19,000	[r]20,000	20,000
Metal, refined:[e] [5]					
Primary	[3]15,626	21,000	[r]3,200	([6])	15,000
Secondary	4,000	4,000	1,000	([6])	--
Manganese:					
Ore, crude:					
Gross weight	60,050	64,517	63,700	40,140	42,000
Metal content	18,015	19,355	19,110	12,042	12,600
Concentrate:					
Gross weight	5,555	5,800	5,500	4,636	5,000
Metal content	2,722	2,842	2,695	2,272	2,450
Nickel:					
Ni content of nickeliferous iron ore[7]	15,237	15,600	[r e]5,000	[r]13,000	16,700
Ni content of alloys	13,880	12,700	[r e]4,500	[r]11,700	15,000
Silver: Mine output, metal content thousand troy ounces	1,672	1,945	1,582	1,797	1,800
Tin metal, secondary[e]	45	45	40	40	40
Zinc:					
Mine output, metal content	27,100	27,000	[r e]20,400	[r]21,300	21,500
Metal including secondary	[r]142	416	NA	NA	NA
NONMETALS					
Abrasives, natural: Emery[e]	[3]9,582	[r]9,000	([6])	[r]8,000	9,000
Asbestos:					
Ore	44,355	[r]599,126	1,562,260	2,489,950	2,500,000
Processed	--	--	--	[r]100,000	110,000
Barite:					
Crude ore	98,529	115,768	[e]116,000	90,187	95,000
Concentrate	48,200	47,014	[e]47,000	30,262	30,000
Cement, hydraulic thousand tons	12,680	13,355	6,912	14,196	13,700
Clays:					
Bentonite:					
Crude	501,878	311,947	[e]312,000	688,941	700,000
Processed	362,013	185,627	[e]186,000	214,193	220,000
Kaolin:					
Crude	42,546	[e]42,500	[e]42,500	60,749	61,000
Processed	11,489	[e]11,000	[e]11,000	6,032	6,000
Fluorspar, grade unspecified	400	292	[e]300	300	300
Gypsum and anhydrite	485,053	629,489	[e]500,000	500,000	500,000
Magnesite:					
Crude thousand tons	[r]1,247	[r]962	967	891	900
Dead-burned	[r]392,666	[r]273,366	285,572	251,692	260,000
Caustic-calcined	[r]85,898	[r]79,776	86,930	113,026	114,000
Nitrogen: N content of ammonia	226,000	255,000	254,800	255,000	230,000
Perlite:					
Crude	278,912	253,780	[e]245,000	206,882	210,000
Screened	198,150	131,750	[e]135,000	151,601	140,000
Pozzolan (Santorin earth) thousand tons	1,460	1,482	[e]1,500	911	155,000
Pumice	928,535	620,585	[e]625,000	500,460	600,000
Pyrites, gross weight	147,298	[e]147,000	[e]147,000	143,518	145,000
Salt, all types thousand tons	121	131	132	133	133
Silica (probably silica sand)[e]	28,000	28,000	28,000	[3]1,908	2,000

See footnotes at end of table.

Table 1.—Greece: Production of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity[2]	1980	1981	1982	1983[e]	1984[e]
NONMETALS —Continued					
Sodium compounds:[e]					
Carbonate	[3]10,878	11,000	11,500	12,000	12,000
Sulfate	1,000	1,000	1,000	1,000	1,000
Stone: Marble cubic meters	211,729	[r]216,412	[e]250,000	260,000	270,000
Sulfur:					
S content of pyrites thousand tons	[r]67	[r]74	52	65	60
Byproduct of petroleum do.	4	7	8	5	5
Talc and steatite	1,460	[e]1,400	[e]1,500	1,666	1,600
MINERAL FUELS AND RELATED MATERIALS					
Coal including briquets:					
Lignite thousand tons	23,207	27,107	26,843	30,580	[3]31,576
Lignite briquets do.	97	[r]69	108	120	120
Coke:					
Coke oven do.	267	[r]47	306	300	300
Gashouse do.	15	15	16	15	15
Gas:					
Manufactured, gasworks[e] million cubic feet	12	12	12	15	15
Natural do.	NA	1,351	4,416	5,000	[3]6,756
Petroleum:					
Crude thousand 42-gallon barrels	--	1,538	7,618	10,000	[3]9,668
Refinery products:					
Gasoline do.	9,690	13,277	14,952	14,500	[3]14,136
Jet fuel do.	10,632	12,976	13,504	13,000	[3]11,696
Kerosine do.	333	357	332	300	[3]217
Distillate fuel oil do.	27,505	29,407	29,479	29,000	[3]28,378
Residual fuel oil do.	41,772	45,841	41,878	35,000	[3]29,417
Lubricants do.	535	618	687	650	630
Other do.	10,240	3,400	3,349	3,400	[3]3,852
Refinery fuel and losses do.	4,060	3,465	4,969	4,500	[3]3,521
Total do.	104,767	109,341	109,150	100,350	91,847

[e]Estimated. [r]Revised. NA Not available.

[1]Table includes data available through Aug. 1985.

[2]In addition to the commodities listed, a variety of other crude construction materials (clays, sand and gravel, and stone) is produced, but output is not reported, and available information is inadequate to make reliable estimates of output levels. Cobalt is also produced and is included with "Nickel."

[3]Reported figure.

[4]Ni content is also reported under "Nickel."

[5]Includes antimonial lead and hard lead.

[6]Revised to zero.

[7]Includes Co content.

TRADE

Greece's overall trade balance improved somewhat compared with that of 1983. The trade deficit for the first quarter of 1984 declined by approximately 5%. However, an uncertain investment climate, owing to policies of nationalization and capital repatriation restrictions continued to adversely affect foreign investment.

Since 1981, there has been an apparent increase in commercial activity in the minerals field with the member states of the Council for Mutual Economic Assistance (CMEA). The U.S.S.R. was Greece's largest trade partner within CMEA. In 1984, the trade balance favored the U.S.S.R.; Greek exports to the U.S.S.R., compared with that of 1983, declined by about 30%, while imports from the U.S.S.R. increased about 9%. The U.S.S.R. supplied Greece with petroleum and refinery products, coal, electricity, ammonia, scrap iron, machinery, and other durables in exchange for agricultural products, bauxite, and lead and zinc ores and concentrates. Because of the 1984 trade imbalance, the Greek Government reportedly expected to increase exports to the U.S.S.R. by 70% in 1985. Negotiations were conducted during 1984 on the construction of a pipeline that would supply Soviet natural gas to Greece and would be paid for in part by increases of traditional Greek exports as well as by the construction and repair of ships for the U.S.S.R.

Greece and the German Democratic Republic reached an agreement in 1984 that in principle foresaw a tripling of Greek ex-

ports to the German Democratic Republic, with the share of minerals and industrial goods reaching 40% of total exports.

Commercial agreements with countries of the Near East and North Africa remained an important source of crude petroleum and an important market for sales of Greek products such as aluminum, cement, gypsum, and quarry products.

Table 2.—Greece: Exports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate thousand tons	1,441	1,411	--	U.S.S.R. 587; Romania 417; Netherlands 125.
Oxides and hydroxides	130,000	110,500	--	All to Netherlands.
Metal including alloys:				
Scrap	93	884	--	Belgium-Luxembourg 278; France 218.
Unwrought	66,608	50,085	--	Italy 28,645; France 19,428.
Semimanufactures	29,129	40,547	2,267	Saudi Arabia 18,809; West Germany 4,567.
Chromium:				
Ore and concentrate	12,175	12,030	--	West Germany 9,080.
Metal including alloys, all forms	--	185	--	NA.
Copper:				
Ash and residue containing copper	251	696	--	West Germany 556.
Metal including alloys:				
Scrap	430	1,263	--	Belgium-Luxembourg 502.
Unwrought	98	274	--	All to Iran.
Semimanufactures	14,013	15,027	132	West Germany 2,820; Libya 2,500; Italy 2,098.
Iron and steel:				
Iron ore and concentrate, pyrite, roasted	14,300	--		
Metal:				
Scrap	734	1,140	--	Italy 600; West Germany 243.
Pig iron, cast iron, related materials	22	--		
Ferroalloys:				
Ferrochromium	--	11,966	--	West Germany 10,766.
Ferronickel	19,852	33,583	--	West Germany 23,664.
Unspecified	11,535	--		
Steel, primary forms	31,387	99,647	--	Italy 96,336.
Semimanufactures:				
Bars, rods, angles, shapes, sections	111,558	180,001	--	U.S.S.R. 74,272; Algeria 50,773.
Universals, plates, sheets	107,091	89,716	23,015	Yugoslavia 14,181; Belgium-Luxembourg 10,945.
Hoop and strip	15,062	20,206	--	Syria 6,796; Cyprus 6,717.
Rails and accessories	20	--		
Wire	1,084	1,390	--	Libya 824; Saudi Arabia 320.
Tubes, pipes, fittings	94,833	97,495	24,560	U.S.S.R. 38,482; Libya 13,631.
Castings and forgings, rough	648	215	--	West Germany 207.
Lead:				
Ore and concentrate	23,700	36,800	--	Belgium-Luxembourg 15,000; Finland 9,800; Yugoslavia 7,000.
Metal including alloys, scrap	216	--		
Manganese:				
Ore and concentrate, metallurgical-grade	300	1,429	--	Yugoslavia 779; Spain 650.
Oxides	r11,350	3,377	294	Belgium-Luxembourg 1,935.
Mercury 76-pound flasks	116	--		
Nickel:				
Matte and speiss	21	19	--	All to Netherlands.
Ash and residue containing nickel	--	403	--	NA.
Metal including alloys:				
Scrap	43	590	--	All to Netherlands.
Unwrought	403	33	--	Do.
Semimanufactures	356	306	--	Netherlands 287.

See footnotes at end of table.

Table 2.—Greece: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS —Continued				
Silver:				
Waste and sweepings value, thousands	--	$202	--	All to United Kingdom.
Metal including alloys, unwrought and partly wrought do.	$688	$224	--	West Germany $207.
Zinc:				
Ore and concentrate	35,700	57,500	--	France 38,000; Finland 2,500.
Matte	46	128	--	All to West Germany.
Ash and residue containing zinc	1,824	1,421	--	Spain 483; West Germany 425.
Metal including alloys:				
Scrap	1,262	339	--	West Germany 223; Italy 116.
Unwrought	133	26	--	West Germany 24.
Semimanufactures	39	20	--	NA.
Other:				
Ores and concentrates	91,505	100,556	--	Romania 94,555; Italy 3,000.
Oxides and hydroxides	--	99	--	All to Saudi Arabia.
Ashes and residues	50,233	34,342	--	Saudi Arabia 23,796; Egypt 6,821.
Base metals including alloys, all forms	168	38	--	NA.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	279,887	349,400	155,005	United Kingdom 91,265; West Germany 70,579; Algeria 26,260.
Dust and powder of precious and semi-precious stones including diamond value, thousands	$281	$465	$360	West Germany $102.
Grinding and polishing wheels and stones	38	37	--	Egypt 18; France 6.
Asbestos, crude	992	--		
Barite and witherite	36,758	5,400	--	Kuwait 4,500; Malta 900.
Cement thousand tons	6,372	7,886	--	Egypt 3,046; Saudi Arabia 2,735; Algeria 687.
Chalk	796	1,371	--	Saudi Arabia 1,150.
Clays, crude:				
Bentonite	314,533	322,920	--	West Germany 58,920; Canada 52,920.
Kaolin	11,812	13,923	--	Yugoslavia 13,679.
Unspecified	32	18	--	NA.
Fertilizer materials:				
Crude, n.e.s	581	--		
Manufactured:				
Ammonia	50	--		
Potassic	4,500	--		
Unspecified and mixed	20,002	31,281	--	China 16,500; El Salvador 8,600.
Gypsum and plaster	15,150	38,951	--	Saudi Arabia 38,901.
Lime	541	262	--	Cameroon 242.
Magnesium compounds:				
Magnesite	r340,333	362,985	500	West Germany 71,623; Italy 68,918; France 41,681.
Other	10,997	12,276	--	Yugoslavia 10,519.
Pyrite, unroasted	--	100	--	All to Saudi Arabia.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	36,635	45,180	64	Italy 11,698; Libya 7,469.
Worked	83,246	94,911	837	Saudi Arabia 60,083; Kuwait 10,999.
Gravel and crushed rock	68,112	12,016	--	Libya 11,850.
Quartz and quartzite	4,850	17	--	Italy 16.
Sulfur:				
Elemental, crude including native and byproduct	442	4,884	--	Turkey 3,000; Syria 1,187.
Dioxide	145	149	NA	NA.
Sulfuric acid	16,593	1,602	--	Lebanon 743; Syria 280.
Talc, steatite, soapstone, pyrophyllite	105	566	--	Israel 530.
Vermiculite, perlite, chlorite	162,718	163,555	41,093	West Germany 50,990; Italy 15,141.
Other:				
Crude	r3,649	10,666	--	West Germany 2,036.
Slag and dross, not metal-bearing	5,463	28,592	--	France 24,398.
MINERAL FUELS AND RELATED MATERIALS				
Coal: Lignite including briquets	41	5,214	--	Czechoslovakia 5,000.
Coke and semicoke	40	40	--	All to Libya.
Peat including briquets and litter	989	--		

See footnotes at end of table.

Table 2.—Greece: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum refinery products:				
Liquefied petroleum gas thousand 42-gallon barrels	583	797	(2)	Egypt 163; Morocco 151.
Gasoline do.	2,326	1,980	1,359	France 312.
Mineral jelly and wax do.	49	--	--	
Kerosine and jet fuel do.	3,212	2,502	2,055	Switzerland 68.
Distillate fuel oil do.	1,988	919	615	Cyprus 60; Panama 51.
Lubricants do.	210	253	1	Italy 142; Lebanon 21.
Residual fuel oil do.	4,073	3,295	163	Italy 1,598; Bulgaria 243.

rRevised. NA Not available.
[1]Table prepared by Jozef Plachy.
[2]Less than 1/2 unit.

Table 3.—Greece: Imports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate	30	789	--	All from Italy.
Oxides and hydroxides	404	360	124	West Germany 67; United Kingdom 45.
Metal including alloys:				
Scrap	14	6	NA	NA.
Unwrought	3,970	2,119	--	West Germany 1,315; Italy 478.
Semimanufactures	3,958	5,090	494	United Kingdom 1,463; West Germany 1,206.
Antimony:				
Oxides	19	31	--	United Kingdom 19.
Metal including alloys, all forms	8	30	--	China 20; Turkey 6.
Arsenic: Oxides and acids	98	33	--	France 20.
Chromium:				
Ore and concentrate	20	18,719	--	Republic of South Africa 8,877; Albania 4,837.
Oxides and hydroxides	122	147	--	West Germany 120.
Copper:				
Matte and speiss including cement copper	8,864	15,583	738	Belgium-Luxembourg 6,498; Chile 1,882; Spain 1,871.
Oxides and hydroxides	48	55	--	Norway 42.
Sulfate	275	511	10	Italy 250; Yugoslavia 240.
Metal including alloys:				
Scrap	2,129	23	--	Switzerland 19.
Unwrought	17,742	19,272	(2)	Zambia 7,871; Chile 4,178.
Semimanufactures	1,536	3,132	21	West Germany 844; France 763.
Germanium: Metal including alloys, all forms	--	25	--	All from Poland.
Iron and steel:				
Iron ore and concentrate excluding roasted pyrite	51	186	--	West Germany 142.
Metal:				
Scrap	433,779	520,380	134,879	U.S.S.R. 334,395; Bulgaria 21,311.
Pig iron, cast iron, related materials	14,425	16,925	--	U.S.S.R. 13,382; France 1,395.
Ferroalloys:				
Ferrochromium	29	38	--	West Germany 30.
Ferromanganese	4,552	1,686	--	Portugal 1,333.
Ferrosilicomanganese	8,173	4,271	--	Portugal 3,765; Norway 451.
Ferrosilicon	2,424	1,737	--	Norway 809; France 565.
Silicon metal	538	429	--	France 419.
Unspecified	r295	395	33	France 350.
Steel, primary forms	321,671	1,097,207	3	United Kingdom 373,415; Netherlands 243,481; France 153,981.

See footnotes at end of table.

Table 3.—Greece: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS —Continued				
Iron and steel —Continued				
Metal —Continued				
Semimanufactures:				
Bars, rods, angles, shapes, sections	198,473	156,023	(2)	West Germany 27,535; Italy 25,493.
Universals, plates, sheets	198,767	222,409	209	Japan 45,197; France 34,849.
Hoop and strip	66,594	29,013	--	West Germany 11,039; Bulgaria 5,242.
Rails and accessories	2,883	1,216	(2)	Bulgaria 505.
Wire	9,383	8,570	1	West Germany 2,136.
Tubes, pipes, fittings	33,001	27,356	430	West Germany 9,586; France 3,922.
Castings and forgings, rough	1,649	1,524	99	Belgium-Luxembourg 1,162.
Lead:				
Oxides	87	146	--	France 104; Bulgaria 12.
Metal including alloys:				
Unwrought	18,719	23,921	1,069	Morocco 8,875; Australia 4,468.
Semimanufactures	9	2,759	(2)	Japan 2,732.
Magnesium: Metal including alloys:				
Scrap	--	21	--	All from West Germany.
Unwrought	581	424	--	France 193; Norway 186.
Semimanufactures	10	25	(2)	West Germany 17; Austria 5.
Manganese:				
Ore and concentrate, metallurgical-grade	25,157	--	--	
Oxides	152	17	--	Belgium-Luxembourg 15.
Metal including alloys, all forms	458	17	16	France 1.
Mercury 76-pound flasks	116	58	--	West Germany 29.
Nickel:				
Matte and speiss	(2)	42	15	Netherlands 25.
Metal including alloys:				
Unwrought	153	100	40	Finland 22; Canada 15.
Semimanufactures	40	36	(2)	West Germany 18.
Platinum-group metals: Metals including alloys, unwrought and partly wrought value, thousands	$464	$889	$59	West Germany $445; Switzerland $362.
Silicon, high-purity	167	80	--	France 59; Italy 21.
Silver: Metal including alloys, unwrought and partly wrought value, thousands	$2,334	$3,464	$12	West Germany $2,678.
Tin: Metal including alloys:				
Unwrought	298	377	--	Malaysia 256; Indonesia 73.
Semimanufactures	20	19	2	West Germany 9.
Titanium:				
Ore and concentrate	198	18	--	All from Australia.
Oxides	718	487	--	West Germany 232; France 119.
Zinc:				
Oxides	518	405	--	France 144; Netherlands 125.
Metal including alloys:				
Scrap	37	2	--	All from West Germany.
Unwrought	14,248	12,792	--	Belgium-Luxembourg 4,113; Netherlands 1,797.
Semimanufactures	183	132	--	West Germany 43; Yugoslavia 34.
Zirconium: Ore and concentrate	26	102	--	United Kingdom 61; Italy 36.
Other:				
Ores and concentrates	r3,787	3,162	--	Italy 2,445; Australia 343.
Oxides and hydroxides	r197	59	--	West Germany 27; France 21.
Ashes and residues	20	--		
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	77	12	2	Italy 8.
Artificial:				
Corundum	357	297	(2)	West Germany 170; France 68.
Silicon carbide	681	846	--	West Germany 588; Italy 196.
Dust and powder of precious and semi-precious stones including diamond value, thousands	$2,227	$5,131	$503	West Germany $3,254; Belgium-Luxembourg $909.
Grinding and polishing wheels and stones	416	411	1	Italy 258; West Germany 58.
Asbestos, crude	7,102	7,531	--	Republic of South Africa 4,438.
Barite and witherite	6,039	3,420	--	Ireland 3,250.
Boron materials:				
Crude natural borates	600	341	160	Netherlands 180.
Oxides and acids	94	108	--	Yugoslavia 40; Italy 26.
Cement	338	6,682	32	Denmark 6,380.
Chalk	578	481	--	France 207; Austria 96.

See footnotes at end of table.

Table 3.—Greece: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
NONMETALS —Continued				
Clays, crude:				
Bentonite	1,250	617	20	West Germany 99.
Chamotte earth	1,436	1,468	--	Czechoslovakia 684.
Kaolin	43,753	37,921	263	United Kingdom 25,278.
Unspecified	r5,174	17,642	248	United Kingdom 14,169.
Cryolite and chiolite	5	5	--	All from Denmark.
Diamond:				
Gem, not set or strung value, thousands	$17	$82	--	Belgium-Luxembourg $72.
Industrial stones do.	$44	$251	--	West Germany $223.
Diatomite and infusorial earth	553	744	286	United Kingdom 126; Italy 97.
Feldspar	2,427	2,216	--	Italy 1,053; Norway 682.
Feldspar, fluorspar, related materials:				
Feldspar	2,427			
Fluorspar	648			
Unspecified	r5,749	5,682	--	Norway 3,243.
Fertilizer materials: Manufactured:				
Ammonia	145,754	183,170	2	U.S.S.R. 82,515; Trinidad and Tobago 37,792.
Nitrogenous	174,255	95,337	--	Romania 38,719; Italy 27,971.
Phosphatic	20	--	--	
Potassic	2,317	5,607	--	West Germany 2,701.
Unspecified and mixed	4,274	3,642	167	West Germany 2,536.
Fluorspar	648	6,024	--	Italy 3,131; Spain 2,870.
Graphite, natural	252	332	--	West Germany 116; Austria 59.
Gypsum and plaster	988	812	--	Italy 535; West Germany 261.
Kyanite and related materials	633	171	--	United Kingdom 150.
Lime	2	1	--	All from Netherlands.
Magnesium compounds:				
Magnesite	r120	3,995	--	All from Turkey.
Oxides and hydroxides	135	119	1	West Germany 46.
Other	140	3,025	--	Turkey 2,906.
Mica:				
Crude including splittngs and waste	210	139	6	Austria 92; India 25.
Worked including agglomerated splittings	26	2	--	A'' from Belgium-Luxembourg.
Nitrates, crude		519	--	Bulgaria 514.
Phosphates, crude	359,340	126,193	--	Tunisia 60,005; Morocco 39,664.
Pigments, mineral:				
Natural, crude	93	53	--	Cyprus 18.
Iron oxides and hydroxides, processed	1,490	1,389	(2)	West Germany 1,062.
Precious and semiprecious stones other than diamond:				
Natural value, thousands	$57	$94	$2	Thailand $49; West Germany $33.
Synthetic do.	$3	$46	--	Thailand $43.
Pyrite, unroasted	112,799	67,452	--	Spain 55,011; U.S.S.R. 12,441.
Salt and brine	23,959	16,635	--	Italy 14,441; France 1,233.
Sodium compounds, n.e.s.: Carbonate, manufactured	23,609	24,021	--	Bulgaria 7,292; Turkey 6,289.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	1,793	1,014	--	Pakistan 349; Turkey 249.
Worked	341	282	--	Italy 239.
Dolomite, chiefly refractory-grade	4,516	1,088	--	Italy 672; United Kingdom 224.
Gravel and crushed rock	604	631	--	France 322.
Quartz and quartzite	195	32	--	France 22.
Sand other than metal-bearing	84,057	87,705	4	Belgium-Luxembourg 63,985.
Sulfur:				
Elemental:				
Crude including native and byproduct	142,250	43,294	--	France 29,700; Poland 10,822.
Colloidal, precipitated, sublimed	58	59	--	West Germany 49.
Sulfuric acid	34	44	--	West Germany 13; Italy 13.
Talc, steatite, soapstone, pyrophyllite	1,612	1,738	3	Belgium-Luxembourg 358; France 333.
Other:				
Crude	984	645	--	Gabon 162; Italy 112.
Slag and dross, not metal-bearing	692,068	549,421	--	Italy 354,299; West Germany 95,494.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	32	41	--	France 31.
Carbon: Carbon black	6,004	4,991	7	Italy 4,109.

See footnotes at end of table.

Table 3.—Greece: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Coal:				
Anthracite and bituminous	385,604	527,456	194,852	Republic of South Africa 319,803.
Briquets of anthracite and bituminous coal	80	1,115	1,066	Czechoslovakia 49.
Coke and semicoke	33,549	50,289	--	Poland 26,821; Italy 15,601.
Peat including briquets and litter	5,861	8,857	--	U.S.S.R. 6,792; Netherlands 1,700.
Petroleum:				
Crude thousand 42-gallon barrels	85,340	82,151	--	Saudi Arabia 44,248; Iraq 13,648; Libya 10,715.
Refinery products:				
Liquefied petroleum gas do	13	21	(2)	Italy 14; France 7.
Gasoline do	194	427	298	France 43; Italy 42.
Mineral jelly and wax do	6	9	(2)	West Germany 5.
Kerosine and jet fuel do	119	206	(2)	France 101; Italy 51.
Distillate fuel oil do	259	319	--	Albania 145; U.S.S.R. 59.
Lubricants do	446	544	3	Netherlands 211; Italy 135.
Residual fuel oil do	303	774	--	Libya 347; Bulgaria 176.
Bitumen and other residues do	202	349	--	Albania 348.
Bituminous mixtures do	9	2	(2)	Italy 1.
Petroleum coke do	357	299	223	France 76.

[r]Revised. NA Not available.
[1]Table prepared by Jozef Plachy.
[2]Less than 1/2 unit.

COMMODITY REVIEW

METALS

Aluminum and Bauxite.—Although bauxite mining declined again in 1984, owing to unfavorable markets, the Bauxites Parnasse Mining Co. S.A., the largest producer, was able to hold production at about 1,200,000 tons, and continue its program of facility expansion in anticipation of the construction of the new alumina plant at Itea. The Itea project, after 6 years of negotiations, was finalized, and an agreement was officially signed by ETVA, on the Greek side, and Raznoimport, representing the U.S.S.R. Construction startup was scheduled for early 1985. In July, the U.S.S.R. officially signed a commitment to purchase at least 380,000 tons per year of alumina over a 10-year period. During the first 7 years, the U.S.S.R. would reportedly pay 13% of the prevailing Aluminium Co. of Canada Ltd. (ALCAN) market price, and during the remaining period the rate would be 12.6% of the prevailing ALCAN price. The contract with the Soviet foreign trade organization Tsvetmetpromexport called for most if not all equipment to be provided by the Soviet Union, which would, reportedly, constitute about 54% of the total investment. In addition, Greece sought further financial and technical assistance for this project, especially from Japan. When completed, the plant would produce about 600,000 tons of alumina per year and employ 700 persons. Moreover, Greece's 1-billion-ton bauxite resource base and 130-million-ton reserves would be sufficient for sustained long-term operation and future expansion.

The dispute in late 1983 between AG and the PPC over proposed increases in the power rates was brought before the Swiss Federal Court at Lausanne for adjudication, and a decision that reportedly favored AG was rendered. However, more pressure was brought to bear on AG by the Greek Government. AG was accused of charging higher prices for domestic sales than for exports. The Government indicated that it would no longer recognize AG's right to set domestic aluminum prices at rates higher than ones for export, and that it would apply unspecified sanctions against the company. AG was also a target of a lobbying effort by the Greek Union of Public Power Corp. Engineers aimed at implementing the country's nationalization program, which would include AG.

Chromite.—The chief developments in the chromium sector included a sharp in-

crease in chromite production at the Skoumtsa Mines as well as a takeover of the Domokos Mines by Hellenic Ferroalloys, a subsidiary of HIMIC, which runs chromite mining operations in Greece.

Production of chromite at the Skoumtsa Mines reached 190,000 tons, and an additional 40,000 tons was mined at the new operations at Moutsara and Aetoraches. Also, a new concentrator, with a 220,000-ton-per-year capacity was reportedly put into operation during the year. Developmental studies were carried out at the old Domokos Mines for initial open pit operations, followed by renewal of underground mining. Continuing exploration for new chromite reserves met with success in 1984, and resulted in a reserve increase of more than three times the production rate.

During the year, the ferrochromium plant at Volos produced at nearly full capacity of 40,000 tons per year. It was planned to expand this facility by the addition of a new unit that would add 60,000 tons per year of capacity to produce high-carbon ferrochromium. Construction startup was reportedly scheduled for 1985.

Gold.—According to the Ministry of Energy and Natural Resources, prospecting and exploration in northern Greece from 1974 to 1984 yielded about 210,000 troy ounces in alluvial deposits. These deposits were at Aghios Mandilos, near Nigria; in the Khimarvos area of Serres; and at Makropotamos and Rodopi. To test the economic feasibility for developing these deposits, a pilot plant was erected late in the year. Also, a small, uneconomic deposit in the Evros River was studied for possible exploitation in conjunction with the major deposits under exploration.

Iron and Steel.—During the first half of 1984, the Greek Government imposed a reported $82 million[2] administrative fine against Halyvourgiki for alleged tax irregularities and illicit foreign transfers of equity despite the fact that the company was cleared of all charges by routine as well as special tax courts. Company equity transfers were found to have been done properly and only after prior clearance was provided by the state's Currency Committee. Also, a corresponding amount of foreign capital was brought into the country. The fine levied against Halyvourgiki, the largest Greek steel producer, was about five times the company's total assets. Moreover, the company was denied the right to borrow in the public sector in Greece for 5 years, making the company insolvent, a "problem industry," and, therefore, within the legal bounds of nationalization, but without any compensation by the state. Similar actions were reportedly being prepared against Hellenic Steel, the country's largest specialty steel producer and a subsidiary of Nippon Kokan K.K. of Japan, for allegedly offering lower prices to favored private sector buyers rather than to state-owned customers. The Greek Government also issued appeals to foreign and domestic private investors for large-scale investment in the country's industry.

Reportedly, the Greek Government accepted a proposal by HIMIC to plan the construction of stainless steel and cold rolling units that would use domestically produced ferroalloys. Plans for this project were to be completed in 1985, and construction bids would be accepted from foreign investors for the initial stages of the stainless steel plant.

At yearend, about 1,600 tons of Greek cold-reduced coil, labeled as blackplate on U.S. entry documents, was seized by U.S. Customs agents. The U.S. Customs Service indicated that this was in violation of EEC export licensing rules, since the export of blackplate did not require a license from the EEC and had a 1% lower U.S. duty than cold-reduced sheet and coil. The seizure resulted from increased surveillance following a U.S. Government decision to limit steel imports to 18.5% of the domestic market.

Lead and Zinc.—The former Peñarroya subsidiary Compagnie Française des Mines du Laurium S.A.F., renamed the Hellenic Mining and Metallurgical Co. of Laurium S.A. (EMMEL), restarted its lead smelting furnaces at Lavrion after the completion of modernization and expansion in 1984. The new company was largely state owned with ETVA and HIMIC as the participating state bodies; however, one-third of the shares were owned by the workers and the town of Lavrion. Approximately 50% of the feedstock was to be supplied from the Kassandra mixed sulfide mines at Chalkidiki; the balance of the lead concentrates would have to be imported because Kassandra mixed sulfide ores were technologically not wholly suitable for the Laurium beneficiation and smelting operations, which were designed for treating only lead-silver ores. Moreover, there were long-term commitments to other customers by the Kassandra mines. Exploration for new sulfide deposits in the Lav-

rion region was planned by EMMEL and IGME to make the Lavrion operation self-sufficient.

Planned production at the EMMEL operation included about 20,000 tons per year of lead and lead alloys; 350 tons per year of bismuth and about 35 tons of gold-bearing silver.

During the year, construction work continued on the 400-meter shaft of the Olympias Mine of the Kassandra Group. Operational startup was scheduled for 1985.

Nickel.—Market conditions remained favorable for Larco S.A.'s nickel mining and processing operations. Reportedly, production increased to over 15,000 tons of nickel from about 12,000 tons in 1983, and plans for 1985 aimed to increase production to about 18,000 tons of metal.

NONMETALS

Greece remained a significant European producer and exporter of nonmetallic industrial minerals. The country was the sole EEC producer of magnesite, with production reaching approximately 6% of total world output. Apart from magnesite, Greece was an important producer of barite, bentonite, gypsum, marble, perlite, and pumice. Most nonmetallics, with the exception of barite and perlite, experienced favorable market conditions in 1984. A sharp decline in demand resulted in a temporary suspension of barite mined by Mykobar S.A. at its Mykonos operation.

Asbestos.—Operations continued to improve at the asbestos mines of Northern Greece S.A.'s Zidani mining complex. Difficulties connected with the plant's shakedown period were apparently eliminated, and the mining complex was able to increase production in 1984 by almost 40% compared with that of 1983. Product sales reportedly reached 35,000 tons in 1984, a 30% increase over that of 1983.

Cement.—Reportedly, exports and production each declined by 3.5% compared with those of 1983. Cement, sold almost entirely to Mideast countries, had been one of Greece's most profitable export commodities. The industry's decline was partly due to increased sales by traditional European competitors, as well as from the Jordanian entry into the market as an exporter. Moreover, domestic price controls by the Greek Government, setting prices below production cost, have been subsidized by profits made in this sector. Losses incurred in domestic sales were compensated by profits made abroad. This prevented the Greek cement industry from competing effectively in its usual markets.

The Halkis Cement Co. completed modernization and expansion at the Halkis cement plant, where capacity was increased to 3 million tons per year. A precalcining system was installed, and the three burning units at the plant were converted for coal use. During the year, the Government began litigation procedures against the former management of the Heracles General Cement Co., the largest producer, which was nationalized late in 1983.

Magnesite.—After taking over the Scalistiris Group, Greece's largest magnesite producer, Government spokespersons indicated that the state will have a basic role in the future management of this company. Production results for the first quarter of 1984 indicated a 21.3% increase for raw magnesite, a 30.4% increase in dead-burned magnesite and Magflot, and a 28.7% increase in refractories compared with the same period in 1983.

MINERAL FUELS

Greece's consumption of primary energy was about 26 million tons of standard coal equivalent, an increase of about 4.9% compared with that of 1983. The share of domestic coal was 23.2% of the total; that of imported coal was 6.5%; petroleum and natural gas, 62.2%; domestic hydroelectric power, 4.3%; and imported electricity, 3.8%.

Coal.—Greece's lignite reserves were measured at about 5,140 million tons with the main deposits at Megalopolis in the Peloponnesus, and at Ptolemaïs in northern Greece. During the year, a new lignite deposit was reportedly discovered at Drama in northern Greece. The lignite field was measured at 30 square kilometers and had about 500 million tons of recoverable reserves. Samples indicated a thermal value of 1,000 to 1,100 kilocalories per kilogram. The PPC indicated that the field could potentially support two 300-megawatt electric power stations.

During the year, Greek authorities reported a number of problems with 400,000 tons of steam-raising coal imported from the U.S.S.R. The first consignments contained pieces of concrete reinforcing rods, scrap iron, broken steel springs, hammers, pieces of timber, and stones as large as 20 centimeters. The sixth and seventh consignments reportedly contained broken spades and railway brakeshoes. The coal could not

be routinely pulverized for furnace hoppers.

Petroleum and Natural Gas.—The Aspropyrgos state oil refineries planned facility expansion and modernization. This work would include the installation of new units for converting fuel oil to lighter refinery products. The total project was scheduled for completion late in 1987 at a cost of $300 million. Contracts for planning and technology for this project were signed with Exxon Corp. (United States), Union Carbide Corp. (United States), Institute Française du Petrole (France), Lummus Ltd. (United Kingdom), and Foster Wheeler Italiana S.p.A. (Italy). After lengthy negotiations, the Greek Government acquired the Esso Pappas Group, Exxon's Greek subsidiary, in March. This company would have probably ended its operations if the Government had not bought it.

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[1]Foreign mineral specialist, Division of International Minerals.

[2]Data were provided in U.S. dollars. The official exchange rate for Greek drachmas (Dr) at the end of Dec. 1984 was Dr128.48 = US$1.00.

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